THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR METALS

Volume XII — FEBRUARY, 1939 — No. 2

JOHN CRERAR LIBRARY FEB 27 1939

Extrusion of Al Shows Much Advancement

Production of Intricate Parts Made Possible by Impact Extrusion Process

By H. D. McCarty

Baltimore Chapter, at its fourth meeting, heard Howes Bodfish of the Aluminum Company of America speak on "Recent Developments in Aluminum Alloys".

The use of aluminum in medium carbon steel as a deoxidizer had been going on for many years, the theoretical amount for complete deoxidization in a steel casting being ½ lb. per ton. In practice, about 1½ to 2 lb. is used.

Mr. Bodfish next pointed out that there are some who believe that when just enough aluminum is used, a sulphide eutectic is formed, and when too little is used, an iron-manganese sulphide is formed.

Perhaps the greatest advancement has taken place in the field of extrusion, where more difficult and intricate shapes are now formed from aluminum and its alloys. Some of these extrusions actually increase the yield point. For instance, an aluminum alloy might be rated at 40,000 psi. yield point, and after extrusion might possibly be guaranteed for 51,000 psi.

Aluminum has an enormous capacity for receiving shock. This has been well illustrated in his own mills, Mr. Bodfish stated, by an aluminum pillow which absorbed a tremendous shock, both rubber and steel having previously failed completely.

Various products made by impact extrusion were shown and the process described in brief. It was shown that continual development of impact extrusion is making possible the production of more intricate and difficult parts.

After closing his talk, the speaker agreed most willingly to answer questions, and one of the liveliest and wittiest discussions of the year ensued. Our able chairman, Leo Gould, called on all types of prominent men in the metals field. Mr. Bodfish answered question after question from the Rustless Iron men, who, of course, are in competition with aluminum so far as corrosion and strength are concerned.

Oregon Chapter Gains First Sustaining Member

By G. E. Healy

Oregon Chapter—At the meeting held at Lloyds Golf Club on Jan. 13, Vice-Chairman Norton Peck introduced representatives of the local branch of the Bethlehem Steel Co., first sustaining member of the Oregon Chapter.

Chairman Ulrich then introduced George M. Huck, metallurgist, Alloy Division, Bethlehem Steel Co.

A talking motion picture, "The Making of Alloy Steels", produced by the Bethlehem Steel Co., was shown, and Mr. Huck then outlined the precautions and control used to produce alloy steels of high quality and uniformity.

At the conclusion of his talk, Mr. Huck answered many questions asked by the members concerning methods of heat treatment of steel.

The officers and members of the American Society for Metals take this occasion to express their sincere sympathy to President W. P. Woodside on the untimely death of his wife on Feb. 14.

Brightness no Longer Main Consideration In Stainless Steels

By R. J. Haigis

Hartford Chapter—High chromium steels were originally designed to resist rusting and staining under atmospheric conditions, said Russell Franks, metallurgical engineer of the Union Carbide and Carbon Research Laboratories, speaking on "Corrosion Resisting Steels" at the meeting on Jan. 10.

Today the main consideration in corrosion resisting steels is not how long they will remain bright, but what chemicals and acids they will resist, what engineering properties they possess, what new fields they will serve, and what old industries are opened up or broadened by their applications.

He pointed out that basically there are two types of corrosion resisting steels—the plain chromium with 12 to 30% Cr, and the chromium-nickel type with 12 to 30% Cr and 8 to 22% Ni.

The plain chromium steels are further divided into the 12 to 15% Cr group (this group, in turn, being subdivided according to carbon content), the 15 to 18% Cr group, and the 23 to 30% Cr group. Of the chromium-nickel type, 18-8 is the best known.

Benefits of Alloys Shown

Mr. Franks explained the characteristics, properties and general application of each particular type and group, and showed the benefits to be derived from adding nitrogen to the 25% Cr steels, and molybdenum, columbium and titanium to the 18-8 steels.

His manner of presentation was particularly good, since it was slow enough so that all details could be grasped and yet not so slow as to become tiresome. His lantern slides were excellent. In short, Mr. Franks's talk was the type which appeals to the cosmopolitan group which attend Hartford Chapter meetings.

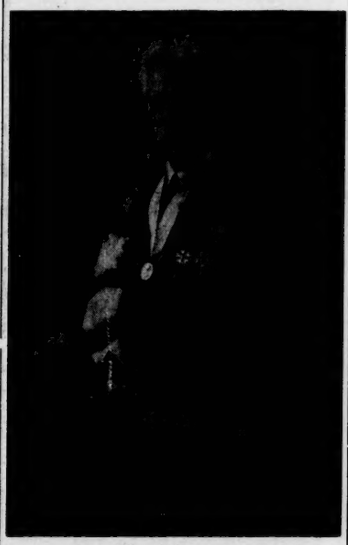
At the dinner at the City Club previous to the meeting, a movie on aluminum furnished through the courtesy of the Aluminum Co. of America provided instructive entertainment.

Another item which should not pass without notice is the new microphone and amplifying system recently purchased by the Chapter. There is no question about its value.

Technical Chairman Jimmy Allison's quavering tenor became a sound of magnificent beauty and volume. There was no possibility that any utterance would go unheard. In fact, at times it sounded like the blast that brought down the walls of Jericho.

At any rate, before the next meeting, it is promised either that some of the tubes will be broken or ear muffs will be furnished to each attendant!

Albert Sauveur, Famed as Dean Of Metallurgists, Dies Aged 75



Albert Sauveur

A. S. M. Represented at Funeral by National Officers, Boston Chapter Delegation

Albert Sauveur, affectionately known throughout the metallurgical world as "dean of American metallurgists", died Jan. 26 at the age of 75.

Pioneer metallographist, Dr. Sauveur produced the first photomicrographs of steel made in the United States. This was during the nineties when he was chemist and metallurgist for Illinois Steel Co.

Born in Louvain, Belgium, in 1863, educated at the Athenee Royal, Brussels; the School of Mines, Liege; and finally at Massachusetts Institute of Technology, graduating in 1889; he first worked for the Pennsylvania Steel Co.

Later he opened his own laboratory and published the now-famous *Metallographist*, a quarterly which carried most of the important metallographic literature of the day. In 1899 he joined the staff of Harvard University where he established the first metallographic laboratory in any university. Since 1924 he has been Gordon McKay Professor of Mining and Metallurgy.

One of his best-known contributions to the science of metals and to the art of teaching is his book "Metallography and Heat Treatment of Iron and Steel", the first edition published in 1912.

Honors, awards, degrees which have accrued to Dr. Sauveur are legion. Always active in the affairs of the American Society for Metals, he was the inspiration and first recipient of the Albert Sauveur Achievement Medal.

Perhaps nothing shows more clearly the esteem in which he was held by his contemporaries than the establishment of "Sauveur Night" in many A.S.M. chapters.

Up to the time of his death he was active in metallurgical affairs and was the author and instigator of much correspondence and discussion in recent issues of METAL PROGRESS on the subject of nomenclature of steel structures.

The A.S.M. was represented at the funeral by Past-Presidents A. H. d'Arcambal and F. P. Gilligan, and National Treasurer Bradley Stoughton, as well as a delegation from the Boston Chapter, of which Dr. Sauveur was a member.

Woodside & Eisenman Come to Visit Chicago

By Alfred R. Conti

Chicago Chapter—Once every year the president of the A.S.M. comes to visit. This year on Jan. 12 President W. P. Woodside, and secretary W. H. Eisenman, as inseparable as Bergen and McCarthy, again honored the Chicago Chapter on President's Night.

Over 300 members and guests attended this unusual meeting. International Harvester Co., had 100 of its astucious metallurgical personages present. Republic Steel boasted 65.

The program after dinner started and ended with a song. L. A. Lindberg led the assembled mob in the Star Spangled Banner and Mr. Eisenman ended by singing the blues and saying he was going to get even with Woodside for that last crack.

Secretary Eisenman, in his own jesting way, introduced to the waiting throng President Woodside, who, after a few counter remarks, went into his talk and movie, "The March of Alloys in Steel", which showed the immense strides made by the steel industry in the last 30 years.

The Chicago Chapter is very grateful to President Woodside and Secretary Eisenman for a very entertaining and educational evening. May their time in office be always as pleasant as this one night spent with us.

Convention Papers Invited

All members of the Society are cordially invited to submit technical papers to the Publication Committee for its consideration for presentation before the National Metal Congress in Chicago next fall.

Papers should be sent to the National Office in Cleveland to the attention of Ray T. Bayless, assistant secretary, American Society for Metals, not later than June 26, 1939.

Compliments

To Wheeling Steel Corp.'s Frank Norris, open-hearth metallurgist, who, on extremely short notice, did an excellent job of discussing manufacture of rimming steel at a recent meeting of the Pittsburgh Chapter.

To METAL PROGRESS Veteran Correspondent Albert Portevin, distinguished French metallurgist, on election to honorary membership in the American Institute of Mining and Metallurgical Engineers.

To C. W. Heppenstall, since 1920 president and treasurer of Heppenstall Co., on his recent election as chairman of the board of directors.

THE REVIEW

Published monthly except July and September by the

American Society for Metals

7016 Euclid Ave., Cleveland, O.

W. P. WOODSIDE, *President*
JAMES P. GILL, *Vice-President*
W. H. EISENMAN, *Secretary*
BRADLEY STOUGHTON, *Treasurer*
Trustees
D. S. CLARK S. L. HOYT
F. B. FOLEY H. A. ANDERSON
G. B. WATERHOUSE

Subscriptions fifty cents a year; five cents a copy. Entered as Second Class Matter, July 26, 1930, at the Post Office at Cleveland, Ohio, under the Act of March 3, 1879.

RAY T. BAYLESS.....*Editor*
M. R. HYSLOP.....*Managing Editor*

Cleveland, O., February, 1939
Volume XII No. 2

Journal Surface Is Important to Bearing Life Says Bierbaum

By W. G. Slack

Syracuse Chapter—Opening with a brief historical discussion, C. H. Bierbaum of the Lumen Bearing Co., Buffalo, N. Y., described the early uses and development of the brass, bronze and bearing alloys on Jan. 10.

The main feature of the talk was an explanation of the "Bierbaum Theory of Bearing Surfaces". The theory takes into account the finish on the journal surface and the composition of the bearing metal.

Mr. Bierbaum maintains that one of the essential characteristics of a good bearing metal is the presence of hard particles embedded in the soft matrix. These particles are the ones which carry the load when the bearing is in the "run in" condition.

The surface finish of the journal is extremely important if the bearing is to stand up properly. The speaker deplored the use of carburized or cyanide treated journals.

He maintained that such material is susceptible to cracks, either from thermal conditions or from defects in the steel. The edges of the cracks act like teeth on a milling cutter and as a result the bearing metal is cut away.

The flame hardening process is considered very good for journals. The hard case so produced is not susceptible to cracking or chipping off.

Mr. Bierbaum next discussed lubrication. Many oils are injurious to bearing metal because of corrosion.

The speaker gave an exceedingly interesting résumé of his many years' experience with bearing metals. He is well known for his work on the micro-character, an instrument which measures hardness values of the various constituents in a micro section.

Speaks Informally on Steels

By George E. Stoll

Notre Dame Chapter held a meeting on Wednesday, Dec. 14, in the Engineering Building of the University. The meeting was preceded by a dinner in the University Dining Hall.

Guest speaker of the evening was Earle C. Smith, chief metallurgist of Republic Steel Corp., whose subject was "Steels of Our Time".

The speaker's informal presentation of the very interesting and timely subject pleased the entire audience.

Arc Melting Is Compared to Other Methods

Bigge Points Out Advantages of Basic Arc Over Crucible and Open-Hearth Refining

By J. W. McBean

Ontario Chapter—A large number of exceptionally clear slides were used by H. C. Bigge, superintendent of the electric furnace and tool steel department of the Bethlehem Steel Co., to illustrate a talk on "Basic Arc Electric Melting" at the January meeting.

In comparing the crucible and basic arc methods Mr. Bigge pointed out that even in a modern crucible furnace using producer gas there is a certain lack of unformity, since the pots in the first hole melt before those in the last. In the crucible also it is not feasible to reduce phosphorus and sulphur, but in the arc furnace the refining is readily accomplished and control of carbon pick-up in low carbon stainless and in high speed steel can be done by regulation of the arc.

Mr. Bigge then compared the basic open-hearth to the basic arc furnace.

Because of the oxidizing atmosphere necessary for combustion in the open-hearth, carbon and silicon are largely lost, but in the basic arc furnace oxidation is under accurate control and loss is much less.

Lower Sulphur Attainable

Phosphorus can be reduced during the oxidizing period in the arc furnace and the slag containing the phosphorus removed before making up the reducing slag, thus preventing the phosphorus from going back to the metal.

Sulphur may be removed in both the oxidizing and reducing periods to less than 0.015%. This is lower than can be attained in the open-hearth.

In the open-hearth, an oxidizing condition must be maintained to keep the phosphorus in the slag, and it is therefore necessary to use strongly deoxidizing elements in the metal bath to form easily fused products which will enter the slag. In the arc furnace, when the oxidizing slag is removed, either a neutral or strongly reducing slag can be had as desired.

Reducing Slag Can Be Used

In the basic arc furnace, during the first period when the metal is being melted, the slag is usually oxidizing to reduce the carbon, phosphorus and sulphur. When the carbon and phosphorus are sufficiently lowered, this slag is removed and replaced by a reducing slag containing calcined lime, fluorspar and finely pulverized ferrosilicon, which assists in deoxidizing the metal, lowers its sulphur and protects the bath from either oxidation or absorption of carbon.

For steels with a high percentage of carbon carbonaceous material may be added to form calcium carbide with the lime. For low carbon alloys such as stainless iron ferrosilicon or other deoxidizers may be used instead of carbon.

The degree of oxidation in the first period can be varied according to requirements; the slag may even be reducing if the phosphorus content is low enough, thus keeping the valuable alloy content in the bath.

Alloys are added during the reducing period so as not to be lost to the slag—in fact, the metallic elements in the slag are returned to the bath as the reducing agents are added to the slag.

Fracture samples of the reducing slag are black at first because of the presence of metallic oxides; they change to brown, green, gray and white as deoxidation goes to completion. This was clearly shown by slides.

Lectures on Fundamentals

A series of educational lectures on the "Fundamentals of the Manufacture and Treatment of Iron and Steel" is being presented by the Ontario Chapter in both Toronto and Hamilton starting on Feb. 15.

N. Metcalf and H. B. Chambers will present the lectures dealing with manufacture, while O. W. Ellis will take charge of those concerning treatment.

These lectures will deal in the simplest terms with the fundamentals of the manufacture and treatment of iron and steel. Previous knowledge of the subject will be unnecessary. The shop man, heat treater, apprentice, foreman, engineer, salesman, purchasing agent, or executive will find the course of practical value.

Officers Visit Texas

President Woodside and Secretary Eisenman During a Recent Visit to the Texas Chapter, Photographed on the Ferry Between Galveston and Point Bolivar on the Way to Show Port Arthur, Texas, to Mr. Woodside (Who Was Raised in Port Arthur, Ont.). Between the Secretary (left) and the President are W. W. Farrar of Farrar Industrial Products Co. (member of the Los Angeles Chapter who helped the Texas boys entertain the visitors) and Mrs. R. M. Garrison, wife of the man who took the picture—at least that's their story which they claim can be vouched for by the Texas members!

Rapid Strides Being Made By Foundry in Industry

By Anthony C. Kowalski

Worcester Chapter—In an illustrated lecture on the subject, "Modern Developments in Cast Iron", Donald J. Reese, foundry engineer and metallurgist of the International Nickel Co., impressed his audience with the rapid strides which the foundry is making in industry.

The relative merits of the various furnaces used in the cast iron industry were discussed by Mr. Reese, using slides to augment his explanations. The chemical compositions and heat treatments of several types of cast iron and their specific uses were also brought out.

Attention was called to a lecture course on "Machining of Metals" to be conducted by the Chapter beginning March 6.

The coffee speaker was Captain Walden of the Worcester Insurance Fire Patrol, who presented an interesting movie on "Fire Hazards".

Symposium Planned On Temperature And Measurement

A symposium on "Temperature and its Measurement in Science and Industry" will be held under the auspices of the American Institute of Physics some time next fall.

The symposium will cover many broad fields, its primary purposes being to:

1. Coordinate the treatment of the subject in the sciences and branches of engineering.
2. Review principles and bring up to date the record of recent work.
3. Accumulate contributions for a comprehensive text, to be published as soon as possible after the symposium is held.
4. Reveal the subject as an important branch of physics.
5. Supply schools with the information required for the improvement of curricula.

A representative steering committee is headed by C. O. Fairchild, director of research, C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., chairman.

Those who are interested in taking part in this symposium should communicate with the Institute at an early date, giving information regarding their field of work and the subject of the contribution they wish to make. Inquiries should be addressed to American Institute of Physics, 175 Fifth Ave., New York.

Cold Heading Shows Sensational Economies

By L. F. Herron

Cleveland Chapter met on Jan. 9 to hear T. S. Fuller of the General Electric Co., Schenectady Works, on the subject of "Cold Forging".

Following an introduction by A. E. R. Peterka of the Lamson & Sessions Co., Mr. Fuller spoke on cold heading manufacture, particularly in comparison to screw machine production.

Mr. Fuller first pointed out that strength, durability, finish, tolerance and cost of equipment must be determined before the method of production is selected, and that the attributes of cold heading are high speed, minimum waste and long die life.

He then suggested that there are undoubtedly many parts made by other methods which could be more economically produced by cold forging, particularly where many duplicates are made. Following slides illustrating the headers used for this work, Mr. Fuller described methods of putting compressive stresses in the dies by the use of shrunk-on bands, or by controlled cooling in the quench.

Mr. Fuller then exploded his bombshell of the evening in the form of slides showing various parts and the sensational economies of cold heading over screw machine production of the same item.

After a word of caution in the matter of overly close tolerances, Mr. Fuller closed his highly instructive address and was roundly applauded for his efforts.

Arcos Appoints Distributor

California users of stainless and special alloy electrodes may be interested to learn that Arcos Corp. of Philadelphia has appointed the Ducommun Metals and Supply Co. of Los Angeles and San Francisco as distributor. Ducommun carries warehouse stocks in Los Angeles and San Francisco from which West Coast users can obtain quick deliveries.

Some Technical Ideas on Alloy Castings Given

Specifications, Grain Control, Creep Test, Failure of Carburizing Containers Discussed

By Amos J. McDuff

Boston Chapter—On Dec. 2 George C. McCormick of General Alloys Co. talked on "Some Technical Aspects of Heat and Corrosion Resisting Alloy Castings".

The consumer does not appear to appreciate the fact that the specification of only the chromium and nickel content of corrosion resisting alloys is not sufficient to describe the most desirable casting. The presence of V, Mo, Cb, Ti, S, P, Mn, Si, and C must also be considered in terms of foundry practice and service requirements.

Castings made from scrap may be expected to be dirtier than castings made from virgin material with resultant deleterious effects on corrosion resistance and fatigue limit.

Grain size control is very important. Since the high nickel castings are much more stable than high chromium castings, for some applications the comparison of properties before service favors the latter, the comparison after service favors the former.

Creep Tests Vary From Service

The results of creep tests run at excellently controlled temperatures do not always tie in with service behavior of metals subject to repeated heating and cooling as well as to loading. Stresses caused by thermal shock when a cold load is applied are very high.

In gas carburization the alloy containers must be free from defects and pores in which amorphous carbon can be deposited. The effect of alternate heating and cooling on cracks in which carbon deposits build up leads to rupture. In areas originally free from defects it is observed that carbon deposits follow grain boundaries of the primary crystals.

A lively question period followed. The value of creep tests and the mechanism of failure of carburizing containers were the chief topics discussed.

Past Officers Speak

The coffee talk was given by James W. Anderson, New England branch manager, Dictaphone Sales Corp., on "The Romance of Voice Recording".

Past Chairman Bill Knecht, who recently returned from Europe for a brief interlude, gave a short talk on his political interpretation of the status of Germany, France and England.

Past National President George B. Waterhouse, with his gracious and smiling countenance, disclosed during a few brief but enthusiastic remarks some of the "big doings" of the Society.

Penn State Enjoys Party

Penn State Chapter had a very enjoyable party on Dec. 14 in the School of Mineral Industries.

After seeing several moving pictures of Penn State football and basketball games humorous gifts were presented to all. Refreshments of chocolate milk and sandwiches concluded the evening's entertainment.

At a meeting of the Chapter on Jan. 11, the chairman of the Program Committee announced the program for the remainder of the school year.

It was noted that Charles L. Potter and Elbert C. Hunter, both Met. '38, have secured positions with the Jones and Laughlin Steel Co., Aliquippa, Pa.

Innovations Feature Philadelphia Meeting

Ladies Admitted to A.S.M. Conclaves —Pictorial Evidence Showing Mrs. F. B. Foley Partaking of a Chapter Dinner. Between National Trustee Foley and his wife sits their young son; next to Mrs. Foley is Arvid E. Nissen of Pennsylvania Forge Co.

Seeing Snakes! R. W. Thorne, coffee talker at the December meeting, Philadelphia Chapter, exhibits a harmless New Jersey pine snake.

At the Speakers Table Are Frank Tatnall, Chairman, Entertainment Committee; R. W. Thorne, Dinner Speaker; W. Elmer Titus, Chapter Vice-Chairman; J. R. Vilella, Technical Speaker; H. P. Rassbach, Chairman, Program Committee.

Rhode Island's "January Thaw" Nearly Becomes Heat Wave as Informality Reigns

By Walter M. Saunders, Jr.

Rhode Island Chapter, bearing in mind Webster's definition of the noun "thaw" (State of growing less cold or reserved, or more genial") has for several years omitted its conventional January meeting, and substituted an evening of fun, food, and frivolity, known as a "January Thaw".

This year the event took place on Jan. 6. A dinner of steak, advertised to be at Rockwell B-20, or sea food, guaranteed to withstand the salt spray test, was first on the scheduled program. Many of the more experimentally minded, however, conducted various quenching tests, before, during, and after the dinner, with many astonishing results.

Informality was the spirit of the evening and for some the intended thawing out progressed to a tropical heat wave.

Group singing led by Ed Gaffney of the New York Chapter, especially imported for the occasion, showed a tremendous improvement over previous gatherings, when several impromptu quartettes attempted at the same time to prove that they were entitled to as much fame as that over-publicized quartette from a near-by chapter. (New Haven papers please copy). Ed can certainly play the piano, too, and his opus for two hands and a nose will long be remembered.

A typical professional entertainment followed the dinner, and included the usual variety of dancing, stories, and feats of magic found at stag parties.

Depending on one's viewpoint, the evening was highly successful in carrying out its announced intention of thawing out reserve. Many, however, though glad they were allowed a chance to become genial, look forward to resuming again the normal cold atmosphere of regular meetings. At least it is easier to get to work next day.

54 Register for Course

Forty-six students registered at the first meeting on Jan. 9 of the educational course sponsored by the Indianapolis Chapter. Eight additional registrations were received at the second meeting on Jan. 23.

Subject of the course is "Principles of Heat Treatment of Steel"; Robert L. Heath, metallurgist, Allison Engineering Division, General Motors Corp., is the lecturer.

From comments made by various students, many of whom have had no experience in this field, the program is providing really worth-while information, excellently conveyed.

Chapter Members "See Snakes"; Hear Vilella of U. S. Steel

By H. C. Myers, Jr.

Philadelphia Chapter members literally "saw snakes" at the meeting on Dec. 2 when Richard W. Thorne of the Faitoute Iron and Steel Co. presented a coffee talk accompanied by an actual exhibition.

It was learned, among other things, that a snake will not strike a stationary object, and that there is an easy method to distinguish between the poisonous and non-poisonous varieties. One has round eyes and the other has oval eyes, but since we have forgotten which is which, we will have to continue staying away from snakes.

A short movie depicted the speaker in the process of obtaining snakes for his collection, and served to illustrate that care is the most important feature in handling them.

J. R. Vilella of metallography fame and of U. S. Steel Corp's research laboratory was the technical speaker of the evening. He discussed etchants, methods of polishing, and photographing of specimens.

Each point he brought out was illustrated with slides that few of the Philadelphia members had ever seen equalled. Differences in etchants and in polishing technique were clearly shown by the use of identical fields in the same orientation placed side by side on the slides.

In some cases entirely false structures were shown to be present in materials that had been polished and etched improperly. It was emphasized that correct preparation of a specimen is essential to intelligent interpretation.

Allison Gives Conception of What Metallurgist Should Know About Rolling Mills

By J. Z. Briggs

New York Chapter—The problems of a technical publicity man were entertainingly discussed in an after-dinner talk by W. R. E. Baxter, director of publicity of the American Arbitration Association, on Dec. 12.

F. T. Sisco introduced the speaker of the evening, F. H. Allison, Jr., metallurgist with United Engineering and Foundry Co., Pittsburgh. While rolling mills are generally to be considered a mechanical rather than a metallurgical engineering problem, Dr. Allison stated that his talk represented his own conception of some of the things that a metallurgist would like to know and should know about the different types of rolling mills.

After a brief history of the development of the rolling mill, beginning with Leonardo da Vinci in 1486, the modern rolling mill was discussed. The types of mills are:

1. Blooming, slabbing, and universal plate mills (ingot rolling)
2. Billet, sheet bar, and skelp mills (semi finishing)
3. Structural shape, rail, and plate mills
4. Merchant, rod, and tube mills
5. Sheet and tin plate mills

The chief recent innovation has been the use of the four-high mills for plate, sheet, and strip products.

Dr. Allison presented two extremely interesting films showing some of the most modern four-high continuous sheet mill installations at Ford Motor Co. and Carnegie-Illinois. These films were not only excellent samples of modern technical photography but also gave the audience a good conception of the modern sheet mill.

Free Literature — Mail Coupon Below

Busch Metaphot
A metallurgical microscope with built-in reflex camera—the Busch "Metaphot"—is completely described in several interesting folders just released by George Scherr Co., Inc., This machine has revolutionized testing procedure in hundreds of shops and testing laboratories. Write for Bulletin Cc-206.

Spring Coiler
Sleeper & Hartley's new segment type spring coiler speaks for itself in a new bulletin. Thirteen points of superiority are carefully explained and illustrated. Complete specifications are given. Bulletin Bc-73.

Box-Type Furnaces
The advantages of Hevi Duty box-type electric furnaces are concisely stated in a folder which contains specifications and a fully labeled cross-section of a representative furnace. Bulletin Mx-44.

Heat in Industry
"Wherever Heat Is Used in Industry" is the title of Surface Combustion Corp.'s new booklet which starts with "Surface Combustion" principles and shows a part of various types of standard burners and furnaces and special furnaces. Bulletin Dx-51.

Stressproof
A new Cold Finished Bar is introduced in a colorful booklet just released by the LaSalle Steel Company. Well illustrated, the booklet also contains tables showing substantial savings made by the use of this new steel. Bulletin Lb-52.

Fabrication
"The Fabrication of USS Stainless Steels" is the title of a very attractive 54-page booklet issued by the United States Steel Corp. Describes in detail the welding, riveting and soldering techniques applicable to all the various grades of USS Stainless Steels. Bulletin Hb-79.

Tube Alloys
Practical data on tube alloys compiled by the Technical Department of the Driver-Harris Co. simplify calculations by providing derived constants in the shape of tables and formulae. Handy conversion tables included. Bulletin Ib-19.

Program Controller
Variable temperature control over any period of time can be automatically carried through to completion without supervision by means of a control just publicized by the Wheelco Instruments Company. Bulletin Kb-110.

Immersion Pyrometer
An immersion pyrometer for use with nonferrous metals which can use either plain or protected thermocouples is described in a booklet just released by the Pyrometer Instrument Company. Bulletin Kb-37.

Lectromelt Furnaces
The story behind Lectromelt furnaces is well told in this 48-page booklet issued by the Pittsburgh Lectromelt Furnace Corporation. Tells of development of this type furnace and describes recent improvements. Bulletin Db-18.

High Frequency
The well-known Ajax-Northrup electric furnaces are excellently catalogued in a 22-page book, which covers all sizes and types for laboratory or shop. Includes illustrations, diagrams, tables and charts. Ajax Electrothermic Corp. Bulletin Ia-41.

Ampco Metal
The six grades of Ampco metal, varying in hardness and physical properties but all possessing wear resistance, tensile strength and corrosion resistance, are described in a booklet which also lists its uses in modern industry. Bulletin Ka-175.

Die Blocks
A handy, small size spiral-bound leather notebook is a complete handbook on Heppenstall Company's die blocks. Valuable additional data are contained, as well as a few blank pages for memoranda. Bulletin Ca-122.

X-Ray Examination
The application of X-ray examination and inspection of castings, welding, and food products, as well as practical X-ray crystal analysis, is completely described and strikingly illustrated in General Electric X-Ray Corp.'s new 34-page publication. Bulletin Dy-6.

Metals for Corrosion
Fourteen varieties of Midvaloy corrosion and heat resisting metals are described in a detailed bulletin by The Midvale Co. Properties and applications are listed and illustrated. Bulletin Ca-160.

Recording, Control Equipment
Now available from Baldwin-Southwark Corp. is a new 16-page bulletin illustrating and describing Southwark's complete line of stress-strain recorders and extensometers. Bulletin Bc-67.

Tool Steel Guide
A 36-page booklet which gives a clear picture of the entire range of tool steels and their fields of use, plus a systematic method for selecting the right steel for the purpose, is being released by Bethlehem Steel Co. Bulletin Bc-76.

Ground Shafting
A colorful folder describing Ground Shafting made by Bliss & Laughlin, Inc., is now available through this company. Pictures steps in shafting production. Bulletin Bc-42.

Hydryzing
Hydryzed work is completely described in recent literature released by Lindberg Engineering Co. Points out advantages in particular applications. Bulletin Bc-66.

Racketeer
Fourth in the series of the famous Pangborn advertising pieces on the "Dust Hog" is available through the Pangborn Corp. Bulletin Bc-68.

Magnet Steels
A very handsome booklet describes the permanent magnet steels and castings made by Simonds Saw & Steel Co., including Alnico and Alnic. Bulletin Ba-158.

Commercial Heat Treating
Commercial heat treating in Pittsburgh as practiced by the Pittsburgh Commercial Heat Treating Company is described in literature available through that organization. Bulletin Bc-83.

Glyco Babbitt Metal
Eight-page bulletin explaining the unique physical structure of Glyco Babbitt with its resulting perfect homogeneity and uniformity of quality is now available through Joseph T. Ryerson & Son, Inc., Bulletin Bc-106.

Effect of Silicon
A technical bulletin devoted to the effect of silicon on the properties of certain chromium-molybdenum steel tubes has just been released by Babcock & Wilcox Co. Bulletin Bc-75.

Colmonoy
The high resistance to wear and corrosion which distinguishes Colmonoy alloys and overlay metals is explained in a 4-page catalog just released by Wall-Colmonoy Corp. Bulletin Bc-85.

Furnace Experience
Facts developed through 32 years of engineering and building practically every type of industrial fuel equipment can be obtained through Flinn & Dreffein Co. Bulletin Bc-82.

Economical Microscope
A practical, easily-manipulated microscope for less than $200 is described in a bulletin released by E. Leitz, Inc. Includes all necessary optical accessories. Bulletin Bc-47.

Welding Procedures
Procedures for producing all types of welds in mild steel, for welding all metals used to any extent industrially and for applying surfacing metal to meet any type of wear-action in service . . . in a booklet by The Lincoln Electric Co. Bulletin Bc-10.

Continuous Heat Treating
First literature available on their No. 29-F Heating Machine is now available through the American Gas Furnace Co. Shows picture of machine and gives operating data. Bulletin Bc-11.

Tool Steels
The first of a series of stories on Crucible Steels and their performance has just been released by the Crucible Steel Company of America. Tells in an interesting manner some of the qualities to look for in tool steels. Bulletin Bc-56.

EPI Microscope
The Zeis EPI microscope for the illumination and observation of opaque material has unlimited applications for observing opaque material in dark field, bright field, and polarized light. A descriptive leaflet is published by Carl Zeiss, Inc. Bulletin Aa-28.

Gas Carburizing
A proven Muffleless Gas Carburizing Furnaces with Continental Hypercarb Process for Hardening Steel is thoroughly described in a colorful 4-page booklet issued by Continental Industrial Engineers, Inc. Bulletin Lb-154.

Microtomes
Bausch & Lomb Microtomes and Accessories are described and pictured in a 16-page booklet just issued by that company. Shows a wide range of instruments and explains their uses. Bulletin Lb-35.

Lubrication Improvements
Intensive research which completed important improvements in the field of heavy-duty gear and bearing lubrication is tabulated in a new 12-page illustrated bulletin just released by D. A. Stuart Oil Co., Ltd. Bulletin Lb-118.

Specialized Tester
The Rockwell superficial hardness tester is a specialized instrument for use where the indentation into the work must be kept shallow or of small area, yet sensitivity preserved. A supplement to Wilson Mechanical Instrument Co.'s catalog on the regular Rockwell tester tells all about it. Bulletin Sy-22.

Heat Treat Chart
Heat treaters everywhere should find a heat treating wall chart complete with S.A.E. specifications a very valuable addition to their shops. Published by Chicago Flexible Shaft Co., manufacturers of Stewart industrial furnaces. Bulletin Ka-49.

Laboratory Service
A new edition of "The Metal Analyst" tells about an organization established by Adolph I. Buehler specializing in the installation of metallurgical laboratories. The complete line of laboratory equipment marketed by Buehler is also catalogued. Bulletin Dy-135.

Moly in Steel
Metallurgists, engineers and production executives who are really interested in the metallurgy of steels and their application will want the newly published book on molybdenum steels which has just been released by Climax Molybdenum Company. Bound in loose-leaf manner, this reference book is chock-full of tables which form a volume almost an inch thick. Bulletin Hb-4.

Bell-Type Meter
Economical measurement of low-pressure gas with exceedingly accurate results is described in a new booklet issued by The Foxboro Company. Bulletin Nb-21.

Recuperators
Results obtained with Carborundum Company's recuperators using Carbofrax tubes are fuel savings, closer temperature control, faster heating, and improved furnace atmosphere. Complete engineering data are given in Bulletin Fx-57.

Seamless Tubes
Just prepared by the Timken Steel and Tube Division of Timken Roller Bearing Co. is a "Guide for Users of High Temperature Steels," which presents technical data relating to the various properties of Timken seamless tubes. Bulletin Bb-71.

Pure Metals
Pure, carbide-free metals are described and applications suggested in a pamphlet published by Metal & Thermit Corp., who make pure tungsten, chromium and manganese in addition to the ferro-alloys. Bulletin Ma-64.

Chromel
A new catalog has been issued by Hoskins Mfg. Co. covering Hoskins electric furnaces and Chromel elements, which provide uniform heat and automatic temperature control with excellent production and quality of work. Bulletin Ia-24.

Mo-W High Speed
J. V. Emmons, metallurgist for Cleveland Twist Drill Co. and largely responsible for the development of the molybdenum-tungsten high speed steels known as Mo-Max, has prepared a general description of these new steels. Bulletin Ka-103.

Abrasive Cleaning
Comprehensive information on airless abrasive metal cleaning is contained in a new book on the "Wheelabrator" Tum-Blast, a patented mechanical device made by the American Foundry Equipment Co. Bulletin Fa-112.

Turbo-Compressors
Spencer Turbine Co. has turbo-compressors in all sizes and types for oil and gas-fired furnaces, ovens and foundry cupolas. Special types for special purposes such as gas-tight and corrosion resisting applications are also described in Bulletin Da-70.

Hardness Testers
A handy thing to have around for anyone who does much hardness testing is a complete and detailed catalog of the universal line of hardness testers carried by Pyro-Electro Instrument Co., together with information on various specialized pieces of auxiliary equipment. Bulletin Fb-197.

Electroplating
A complete group of chemicals, processes and materials of interest to those engaged in electroplating is listed in this 8-page booklet published by the E. I. du Pont de Nemours & Co., Inc. Bulletin Eb-29.

Bright Annealing
Various types of electric and fuel-fired furnaces built by the Electric Furnace Co. for bright-annealing wire, tubing, strip and other products are described in a new 8-page folder. Bulletin Lb-30.

Stainless Data Book
All users of stainless and heat resisting alloys should find invaluable the information contained in a booklet published by Maurath, Inc., giving complete analyses of the alloys produced by the different manufacturers, along with the proper electrodes for welding each of them. Bulletin Jy-125.

Heroult Furnace
Revised and expanded to include modern major innovations in the construction and operation of the Heroult electric furnace, a new edition of the American Bridge Co.'s Heroult Electric Furnace Bulletin is now ready for distribution. Bulletin Bb-124.

Heat Resisting Alloys
Authoritative information on alloy castings, especially the chromium-nickel and straight chromium alloys manufactured by General Alloys Co. to resist corrosion and high temperatures, is contained in Bulletin D-17.

Ni-Cr Castings
Compositions, properties, and uses of the high nickel-chromium castings made by The Electro Alloys Co. for heat, corrosion and abrasion resistance are concisely stated in a handy illustrated booklet. Bulletin Fx-32.

Ingot Production
"The Ingot Phase of Steel Production" is the title of a book defining the principles of quality ingot production followed by many well-known steel manufacturers. Gathmann Engineering Co. Bulletin Ka-13.

Bessemer Steel
Jones & Laughlin Steel Corp. has for distribution reprints of the paper by C. C. Henning on "Manufacture and Properties of Bessemer Steel" that received the Robert W. Hunt Award of the A.I.M.E. during 1935. Bulletin Ca-50.

Testing with Monotron
Shore Instrument & Mfg. Co. offers a bulletin on Monotron hardness testing machines which function quickly and accurately under all conditions of practice. Bulletin Je-33.

Accelerated Salt
A Technical Service Bulletin issued by R. & H. Chemicals Dept. of E. I. du Pont de Nemours & Co. gives complete details about their new Accelerated Salt. Bulletin Nb-29.

Welding Aluminum
A very attractive little 48-page booklet which tells all about the welding of aluminum and its alloys has been issued by the Aluminum Company of America. Describes the different methods of welding and shows by means of pictures and diagrams the best methods of welding. Bulletin Hb-54.

Model "Y"
The Sentry Model "Y" electric furnace, using the Sentry Diamond Block method of heat treatment provides exceptional quality high speed steel hardening at minimum production cost. The furnace is described in Bulletin Oy-114.

Defi Rust
Analysis and descriptive notes of nine types of heat and corrosion resisting steels made by Rustless Iron and Steel Co. are contained in a handsome folder. Bulletin Ha-169.

Duronze III
A technical bulletin covering Duronze III, a patented high strength silicon aluminum bronze, has just been released by the Bridgeport Brass Co. Describes typical uses and shows comparative tables. Bulletin Ac-163.

Steel Fabrication
Correct methods for fabricating nickel-clad steel plate are technically outlined in a 16-page folder issued by the International Nickel Co. Included are pictures of correct procedure and helpful tables. Bulletin Ac-45.

Normalizing Heat
"1300 Lbs. Up to Normalizing Heat in 30 Minutes," is the title of a 4-page folder just released by the Leeds & Northrup Co. Bulletin Ac-46.

Ferro-Alloys
An interesting folder by Electro Metallurgical Co. tells all about their ferro-alloys and their special service to users which will help them to operate their furnaces and make alloy additions under the proper conditions. Bulletin Jy-16.

Furnaces
Two booklets, of 27 and 30 pages respectively, catalog, illustrate and fully describe the line of "Electric Heat Treating Furnaces" and "Fuel Fired Furnaces, Ovens and Kilns" built by Holcroft & Company. Bulletin R-197.

Steel Castings
Valuable information concerning physical properties and microstructure is contained in the third edition of "A Classification of Steels for Steel Castings" just published by Detroit Steel Casting Co. This classification simplifies the problem of proper choice of steel. Bulletin R-196.

Steel Selector
The "Machinery Steel Selector," showing physical properties on machinery steels up to 8 in. in cross-section and giving other information useful in selecting the right steel, is now available through the Horace T. Potts Co. Physicals given are for steels in ready-for-use, machinable condition. Bulletin R-198.

Strenes Metal
A colorful folder gives the story of Strenes Metal, a new and unique material that is a chromium-nickel-molybdenum alloy with a high steel base, used primarily for cast-to-shape forming and drawing dies. Bulletin R-199.

The Review
7016 Euclid Ave., Cleveland

Please have sent to me without charge or obligation the following literature. (Circle the numbers that interest you. It is important to write in your company or business connection when you return this coupon.)

Name ..... **Title** .....

Company .....

Company Address .....

Col. 1		Col. 2		Col. 3		Col. 4	
Cc-206	Kb-37	Bc-67	Bc-75	Lb-154	Bb-71	Jy-125	Ha-169
Bc-73	Db-18	Bc-76	Bc-85	Lb-35	Ma-64	Bb-124	Ac-163
Mx-44	Ia-41	Bc-42	Bc-82	Lb-118	Ia-24	D-17	Ac-45
Dx-51	Ka-175	Bc-66	Bc-47	Sy-22	Ka-103	Fx-32	Ac-46
Lb-52	Ca-122	Bc-68	Bc-10	Ka-49	Fa-112	Ka-13	Jy-16
Hb-79	Dy-6	Ba-158	Bc-11	Dy-135	Da-70	Ca-50	R-197
Ib-19	Ca-160	Bc-83	Bc-56	Hb-4	Fb-197	Je-33	R-196
Kb-110		Bc-106	Aa-28	Nb-21	Eb-29	Nb-29	R-198
				Fx-57	Lb-30	Hb-54	R-199
						Oy-114	

Practical Pointers Given in Review Of Stainless Steels

By A. J. McDuff

Boston Chapter—A practical talk entitled "A Review of Developments of Stainless Steel" was given by P. B. Greenawald, metallurgical department, Carpenter Steel Co., on Jan. 6.

The advantages and disadvantages of paints and electroplated coatings on steel for purposes of preventing corrosion were outlined, and the history of the development of stainless steels described. The earlier opinion of chemists—that loss of weight in sulphuric acid was a measure of corrosion resistance—delayed the development of stainless steels considerably, since the corrosion resistance of most stainless alloys in that acid is poor.

Improper tests are causing some consumers to pay more than necessary for corrosion resistance by purchasing higher cost, higher alloyed stainless steel than the actual corrosion conditions require.

Mr. Greenawald classed the commonly used stainless steels according to whether they are pearlitic, ferritic, or austenitic. Obtainable physical properties, the forms available, and typical applications were discussed.

The ratio of carbon to chromium must be correct, the heat treatment must be correct, and the surface must be properly prepared for satisfactory service.

The coffee talk was given by J. H. Pasell of the Morse Twist Drill & Machine Co. He described in detail the "Government of the Beehive". Such efficiency as was described perhaps justifies the regimentation incurred.

Hardy Reviews Powder Metallurgy at Canton

By Gilbert Soler

Canton-Massillon Chapter—The main topic of the meeting held Thursday, Jan. 12, at Hotel Onesto in Canton was a talk by Charles F. Hardy of Charles Hardy, Inc., New York, entitled "Powder Metallurgy".

The speaker stated that metal powders are formed either by the reduction of the pure oxides or by electrolytic deposition. After defining and briefly outlining the field of powder metallurgy, Mr. Hardy discussed at length the various advantages and disadvantages of the product with various applications of powder metallurgy and future possibilities.

Mr. Hardy has appeared before other chapters of the Society and his talk has been outlined in previous issues of THE REVIEW.

The lecture was quite interesting to all members of the Canton-Massillon Chapter. A lively discussion followed the meeting and numerous questions were answered by the speaker.

Tool Steel Course Given

Such a vigorous interest in tool steels has been evinced by so many members of the Los Angeles Chapter that it was decided to make this the topic of an educational lecture series being held Feb. 20, 21, 22, 23, and 24.

Burns George, metallurgical engineer, Vanadium-Alloys Steel Corp., Latrobe, Pa., is the lecturer. He is assistant to Tool Steel Expert and A.S.M. Vice-President James P. Gill.

Mr. George is using as his text Gill's book on "Tool Steels" and will present a great deal of valuable information on practical aspects of the subject.

HERE AND THERE WITH A.S.M. MEMBERS

CHARLES I. WESLEY, president of the Wesley Steel Treating Co., Milwaukee, acted as co-chairman of the Second Annual Regional Foundry Conference held at the Hotel Schroeder, Milwaukee, on Feb. 16 and 17. The conference was sponsored jointly by the University of Wisconsin, department of mining and metallurgy, and the Wisconsin Chapter of American Foundrymen's Association. It embodied class room discussions under the direction of group leaders who represented important industries from all over the country.

C. I. Wesley

* * *

RALPH HARE, formerly with General Alloys Co., has been appointed New England manager of Electro Alloys Co., Elyria, Ohio. Mr. Hare will have headquarters at 716 Farmington Ave., West Hartford, Conn.

* * *

RALPH E. MCGEE of Moline (member of Tri-City Chapter), chief metallurgist of the Farmall Works, International Harvester Co., has been promoted to assistant chief metallurgist for all International Harvester factories.

Mr. McGee has been at the Farmall plant ever since it was operated by the Moline Plow Co., before being acquired by International Harvester some 12 years ago. While he will make his headquarters in Chicago, Mr. McGee will spend considerable time visiting the various factories, and consequently will have occasional opportunities to see friends in Moline and Rock Island.

* * *

DESIGNATING his "Magnaflux" method of testing "a notable contribution to aeronautical engineering", the Institute of the Aeronautical Sciences conferred its Sylvanus Albert Reed award for 1938 on Prof. ALFRED V. DE FOREST of Massachusetts Institute of Technology on Jan. 27.

A. V. de Forest

An authority on physical testing, Professor de Forest is perhaps best known for his non-destructive magnetic method of discovering flaws in metal, which is applicable to detection of forging defects, fatigue and grinding cracks, and non-metallic inclusions.

* * *

ARTHUR J. WILLIAMSON has been added to the technical staff of Summerill Tubing Co., Bridgeport, Conn., as metallurgical engineer in charge of research and development.

With a B.S. from Lehigh University and M.S. obtained in 1933, Mr. Williamson stayed on another year as instructor in metallurgy.

His first commercial work was with J. G. Brill, Philadelphia, and during the last four years he has been research metallurgist at John A. Roebling's Sons Co., Trenton, N. J.

* * *

PROF. HERBERT M. BOYLSTON, who has been on leave of absence from the metallurgical department of Case School of Applied Science, has now voluntarily retired.

H. M. Boylston

Professor Boylston still carries on his consulting metallurgical practice from his home laboratory at 22275 Calverton Rd., Cleveland. He also conducts, as in the past, the well-known correspondence course on "Metallography" founded by Sauveur and Boylston more than 30 years ago and which has graduated over 1000 students.

* * *

LEO J. GOULD has had to resign as chairman of the Baltimore Chapter A.S.M. on being transferred to the Bethlehem plant of Bethlehem Steel Corp. Vice-Chairman J. W. MILLER of the Reid-Avery Co. will fill Mr. Gould's unexpired term as chairman.

* * *

AT THE MEETING of the Montreal Chapter held Feb. 6 it was "Resolved that the Montreal Chapter of the American Society for Metals does hereby record its extreme regret at the loss to metallurgical science following the death of DR. ALBERT SAUVEUR, Gordon McKay professor emeritus of metallography and metallurgy at Harvard University."

Woodside Pinch-Hits For Announcer in Presenting His Movie

By F. D. Steinway

Milwaukee Chapter—"National President's Night" was observed on Jan. 10, with W. P. Woodside in the stellar role, ably supported by W. H. Eisenman, genial national secretary of the Society.

Bill Eisenman maintained his reputation as a raconteur with his tales of the various Chinese maidens encountered in their travels on the West Coast (details upon request). It seems that on these annual trips, Bill has to spend most of his time keeping the National President on the straight and narrow.

The report on the general condition of the Society and of the new National Headquarters was enthusiastically received by all.

Mr. Woodside had to pinch-hit for the announcer in the sound tract of his film "A Panorama of Alloy in Steel", as the combination of d.c. and a.c. available at the Athletic Club did not agree with the constitution of the sound equipment on the projector. Certainly he did a fine job in announcing a film centering around his own life and the development of present-day alloy steels.

After the showing of the film, Mr. Woodside enlarged upon some of the phases of the story, and finished by outlining the present trends in fabrication.

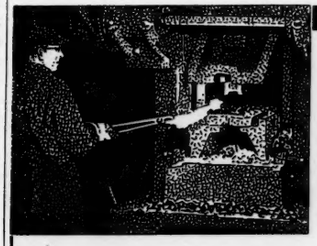
Wm. Campbell Fellowships Announced at Columbia

Through the bequest of the late William Campbell, for many years Howe Professor of Metallurgy at Columbia University, there have been established the William Campbell Fellowships, primarily for scientific research in the field of metals.

These fellowships are available for graduate study and research at Columbia University and carry stipends up to $1200 per year as determined by the Campbell Fellowship Committee.

Applications accompanied by certified transcripts of academic records, proposed research projects and proposed fields of graduate studies should be filed with the Dean of Engineering, Columbia University, New York City, before March 15, 1939. Announcements and application blanks will be forwarded to interested persons upon application to the same address.

A LARGE FIRM of manufacturers wishes to purchase a patented or proprietary article, involving the use of aluminum or magnesium castings in large quantities. Please submit details to Box No. 6, Messrs. T. G. Scott & Son, Ltd., 63, Ludgate Hill, London, E. C. 4, England.



FORGING HANDBOOK

by Waldemar Naujoks and Donald C. Fabel

SECTION HEADINGS

The Forging Industry
Forge Plant Equipment
Die Block and Process Operations
Forge Dies and Tools
Forging Practice
Finishing Operations
Heat Treatment of Forgings
Cleaning of Forgings
The Testing and Inspection of Forgings
Materials Handling
Forge Plant Design
Forge Plant Maintenance
Furnaces and Furnace Design
Designing the Forged Part
Forging Materials
Job Estimating
Costs and Cost Engineering
Forge Shop Safety
Forging Definitions
Mathematical Tables and Data

Until March 10th this worthwhile 630-page handbook will be sold for a special pre-publication price of $6.00 (after this date the book will cost $7.50).

If you use or make forgings . . . don't miss this opportunity to learn all about their design, production, and correct application.

Save $1.50—reserve your copy of the Forging Handbook today!

American Society for Metals
7016 Euclid Ave., Cleveland, Ohio

Gentlemen:

Please send me a copy of the Forging Handbook at the special pre-publication price to members of $6.00. I am attaching check ( ), money order ( ), cash ( ) for this amount.

Name .....
Company .....
Address .....
City ..... State .....

CHAPTER CALENDAR

CHAPTER	DATE	PLACE	SPEAKER	SUBJECT
Baltimore	Mar. 13	Joint Meeting, Washington, D. C.	Carl Thieme	Foundry Metallurgy
Boston	Mar. 3	M.I.T. Room 6-120	H. J. Fischbeck	Metallurgy of Aircraft Engines
Buffalo	Mar. 9	Hotel Buffalo	H. M. Kraner	Refractories in the Steel Industry
Calumet	Mar. 14	Woodmar Country Club, Hammond, Ind.	L. C. Bibber	Welding
Canton-Mass	Mar. 23	Hotel Onesto	L. B. Jones	Investigation of Vibration Stresses in Locomotives
Chicago	Mar. 9	Medinah Club	A. H. d'Arcambal	Precision Cutting Tools and Gages
Cincinnati	Mar. 9	American Airline Hangar	H. J. Fischbeck	Metallurgy of Aircraft Parts
Cleveland	Mar. 6	Cleveland Club	M. A. Grossmann	Hardenability
Columbus	Mar. 7		H. J. Fischbeck	Metallurgy of Aircraft Parts
Dayton	Mar. 8	Wright Field	H. J. Fischbeck	Metallurgy of Aircraft Parts
Detroit	Mar. 13	Fort Shelby Hotel	D. Hanson	Gases in Metals
Hartford	Mar. 14	Hartford Gas Co. Auditorium		Get Acquainted Night
Indianapolis	Mar. 20	Washington Hotel	Arthur A. Focke	Dynamic Properties of Metals
Lehigh Valley	Mar. 3	Hotel Traylor, Allentown, Pa.	F. L. LaQue	Corrosion of Metals
Los Angeles	Mar. 9	Athletic Club	Philip McKenna	Crystalline Inter-Metallic Compounds in Cemented Hard Alloys
Mahoning Val.	Mar. 14	Tod Hotel	W. P. Woodside	President's Address
Milwaukee	Mar. 16	Milwaukee Athletic Club	Charles C. Nitchie	Industrial Spectroscopy
Montreal	Mar. 6	Windsor Hotel	A. N. Otis	Protective Atmospheres for Annealing and Heat Treating Furnaces
Muncie	Mar. 16	Anderson, Ind.	J. F. Lincoln	Welding vs. Prejudice
New Haven	Mar. 16	Conn. Light & Power Co., Waterbury	C. A. Crawford	Nickel and Its Uses
New Jersey	Mar. 20	Essex House, Newark	Clyde Llewelyn	Machinability of Lead-Bearing Steels
New York	Mar. 13		D. K. Crampton	
North West	Mar. 9	Minnesota Union, Univ. of Minn.	A. J. Scheid, Jr.	Tool Steel
Notre Dame	Mar. 8	Engineering Auditorium, Univ. of Notre Dame	D. Hanson	Deformation of Metallic Crystals
Ontario	Mar. 3	Hamilton	A. O. Schaefer	Large Forgings—Their Manufacture and Properties
Oregon	Mar. 10	Lloyds Golf Club		Aluminum
Penn State	Mar. 9		J. R. Vilella	
Penn State	Mar. 29		H. W. McQuaid	
Philadelphia	Mar. 31	Engineers Club	J. P. Gill	Tool Steels
Pittsburgh	Mar. 9	Roosevelt Hotel	J. R. Vilella	Recent Developments in Metallography
Puget Sound	Mar. 8	Engineers Club, Seattle, Wash.	Joseph Mills	Problems of a Steel Foundry
Rhode Island	Mar. 1	Providence Engineering Society Bldg.	E. L. Bartholomew	Interrupted Quench of Cast Iron
Rochester	Mar. 13	Lower Strong Auditorium, Univ. of Rochester	Leo Edelson	Silver Solders
Rockford	Mar. 15	Elks Club	Hans Ernst	Physics of Metal Cutting
Saginaw Val.	Mar. 21	Bancroft Hotel, Saginaw, Mich.	H. W. Graham	Free Machining Steels
Southern Tier	Mar. 27	Jenkins Inn, Waverly, N. Y.	H. W. McQuaid	Factors Which Affect Hardenability of Commercial Steels
Springfield	Mar. 20	Hotel Worthy	F. J. Mawby	Forgings
St. Louis	Mar. 17	York Hotel	J. P. Gill	
Syracuse	Mar. 14		W. R. Frazer	Metallurgical Control in Manufacture of High Speed Tools
Texas	Mar. 8		H. J. French	Recent Progress in Alloy Steels
Toledo	Mar. 27		R. J. McKay	Metallurgy of Nickel Electrodeposits and Nickel Non-Ferrous Alloys
Tri-City	Mar. 14	Rock Island Arsenal	Hans Ernst	Researches in Machinability
Tri-City	Mar. 21	Hotel Fort Armstrong, Rock Island	W. P. Woodside	Panorama of Alloys in Steel
Washington	Mar. 13	Garden House, Dodge Hotel	C. O. Thieme	Foundry Metallurgy
Worcester	Mar. 15	Sanford Riley Hall, Worcester Polytech. Inst.	A. H. d'Arcambal	Cutting Tools
York	Mar. 23	Gettysburg, Pa.	H. W. Dietert	Spectroscopic Analysis

President Gives His 'Panorama of Alloys'

By George E. Stoll

Notre Dame Chapter—National President's Night was held Jan. 11 at the University. Present were president W. P. Woodside, Secretary W. H. Eisenman and Assistant Secretary R. T. Bayless.

Mr. Eisenman, master of repartee and innuendo, introduced Mr. Woodside, vice-president of the Climax Molybdenum Co. Mr. Woodside, in the principal address of the evening, spoke on "Panorama of Alloy Steels".

Engaged in various angles of ferrous metallurgy since the early use of alloys in steel, the speaker was able to present an authentic and panoramic history of the different practical uses. A sound motion picture produced by the Climax Molybdenum Company, shown during the evening, served to supplement Mr. Woodside's address.

The closing discussion was very animated and proved that the assembled group appreciated the opportunity of listening to a man who could relate the history of alloy steel from the early days—a man who could touch each important development with his own experience.

Buffalo Presents Course On Behavior of Metals

Buffalo Chapter is presenting a series of six lectures on "Behavior of Metals in Service" as an educational course. These talks will be made as non-technical as possible so that many shop men and students will avail themselves of this opportunity. The schedule of the lectures is as follows:

Feb. 28—Behavior of Metals Under Static Load; H. J. Cutler, Bethlehem Steel Co.

March 7—Behavior of Metals Under Repeated Loads; M. L. Frey, Republic Steel Corp.

March 14—Behavior of Metals Under Impact; B. L. McCarthy, Wickwire Spencer Steel Co.

March 21—Metals at Different Temperatures; R. C. Spencer, Bliss & Laughlin, Inc.

March 28—What Corrosion Does to Metals; R. Franks, Union Carbide & Carbon Research Laboratories.

April 4—Wear; George F. Roeder, Joseph T. Ryerson & Son, Inc.

Employment Service Bureau

Address answers care A. S. M., 7016 Euclid Ave., Cleveland, unless otherwise stated

Positions Open

INSTRUCTOR: Expanding metallurgical engineering department of well-known university requires young man as instructor and for research work in metallurgy. Must possess pleasing personality as well as professional ability. Application should present full personal information including interests and recent snapshot, describe education (and professional experience, if any), and supply evidence of professional ability. Only applicants capable of development are desired. Box 2-5.

SALES METALLURGIST: Primarily for powdered iron. Should have some experience in powder metallurgy; preferably young, well educated. Write stating all qualifications and experience. Box 2-40.

STEEL SALESMAN: For the state of Indiana. Should have technical education and some experience in a steel mill. Preferably located now in Indiana. Box 2-55.

Positions Wanted

METALLURGICAL ENGINEER desires production or development work with metallurgical or manufacturing concern. Graduate of Cornell University, 1937; age 22; 15 months experience in small manufacturing plant. Interested in a position with a good future. Location immaterial; available immediately. Box 2-10.

POWDER METALLURGIST: Four years experience covering all phases from pilot plant production of powders and parts to pure research on fabrication and treatment. Graduate chemical engineer; trained analyst and metallographer. Excellent references. Available immediately; location immaterial. Age 25, married. Box 2-15.

WORKS MANAGER: E. E. Renssalaer Polytechnic Institute 1914. Has held executive and engineering positions for the past 24 years in the electrical and automotive industry. Desires investigation or production position in the metal, electrical or chemical industry. Box 2-35.

CORROSION ENGINEER: Graduate chemist. 14 years of wide, varied and practical experience in organizing, directing and conducting corrosion research in industrial unit processes; diagnosis of plant corrosion problems and metal equipment failures; corrosion test methods; application of corrosion prevention methods. Knowledge of metallurgy, metallography, physical testing, properties of metals and alloys; familiar with technical literature on corrosion and allied subjects. Now employed; references. Box 2-25.

METALLURGIST: B.S. in engineering; age 30. Five years experience in metallography, physical testing and steel analysis; for past three years metallurgist in charge of heat treat operations and laboratory testing in tractor and truck parts plant. Available on 30 days notice. Box 2-50.

METALLURGIST AND FOUNDRYMAN: Age 34, married. B.S. in physical metallurgy M.I.T., 1932. Ten years practical experience in all departments of aluminum foundry, producing all types of alloys, with four years as foundry superintendent. Two years as superintendent of gray iron cupola operations, metallurgy, and sand control. Personality adapted to handling men, as well as to outside contacts and technical discussion. Box 2-30.

METALLURGIST: Graduate, age 26. Two years research and two years control experience. Familiar with ferrous and non-ferrous heat treating and metallography. Box 2-45.

HEAT TREATER: 25, six years experience, including laboratory practice in heat treating gages, high speed tools, dies of carbon and alloy steels, farming machinery. Can operate oil, gas, electric furnaces, salt baths and hardness testing equipment. Box 10-35.

METALLURGIST: Graduate chemical engineer. Three years experience as metallurgist and engineer in laboratory of industrial gas furnace company; experienced in heat treatment of steel and annealing of malleable iron. Familiar with combustion of gas as fuel or for preparation of special atmospheres. Sales work considered. Age 26. Box 2-20.

BOOKS YOU NEED FOR REFERENCE

The books listed below are written by outstanding men in the metal field. They deserve a place on your reference shelf. To order, just fill in coupon at bottom and mail.

HARDENABILITY OF ALLOY STEELS
Papers presented at the Detroit hardenability symposium. 300 Pages, 161 Illustrations, Cloth Binding, 6 x 9. .....$3.50

INDEX ... All the technical articles in TRANSACTIONS and METAL PROGRESS.
Complete index, 1922 thru 1932....$1.00
Complete index, 1927 thru 1932....$1.00

CARBURIZING....Written by 16 outstanding men in the metal industry with oral and written discussions by 43 authorities.
400 Pages, 200 Illustrations—Cloth Binding, 6 x 9 .....$4.00

OPEN-HEARTH STEEL MAKING....by Earnshaw Cook
A complete reference volume on open-hearth steel making in a form which makes you want to read it through immediately.
250 Pages, 60 Illustrations—Cloth Binding, 6 x 9 .....$2.50

ENGINEERING ALLOYS....by N. E. Woldman and A. J. Dornblatt
At your finger tips the tradenames, the properties, the composition, the uses and the manufacturers of 8206 important commercial alloys from all over the world.
622 Pages—Cloth Binding, 6¼ x 9¼..$10.00

APPLICATION OF SCIENCE TO THE STEEL INDUSTRY....by W. H. Hatfield
Review of British steel making and rolling practice.
154 Pages, 6 x 9—Cloth Binding.....$2.50

PRINCIPLES OF HEAT TREATMENT ....by M. A. Grossmann
An intensive educational course devoted to the fundamental laws and current practice of heat treating steel.
141 Pages, 6 x 9—Cloth Binding.....$2.50

LECTURES ON STEEL AND ITS TREATMENT....by John F. Keller
A blacksmith who by long and careful study has mastered the mysteries of iron and steel so that he makes them understandable through homely similes and everyday comparisons.
329 Pages, 6 x 9—Cloth Binding $3.50

TOOL STEELS....by James P. Gill
A series of five educational lectures on the selection, properties and uses of commercial tool steels.
136 Pages, 6 x 9—Cloth Cover.....$2.50
Paper Cover.....$2.00

THE BOOK OF STAINLESS STEELS ....edited by E. E. Thum
New and enlarged second edition. Written by 82 experts, the book contains 813 pages with 292 illustrations.....$5.00

METALLURGICAL DIALOGUE....by Dr. Albert Sauveur
A unique and informal method of presentation wherein a master answers his pupil's question as to "why steel hardens when plunged red hot in cold water."
200 Pages, 5½ x 8, 12 illustrations—Cloth Binding $3.00

STEEL PHYSICAL PROPERTIES ATLAS....by C. Newman Dawe
Accurate physical characteristics of steels are available at a glance in this authoritative reference book.
90 Pages, 8½ x 11, very heavy paper—Cloth Binding $2.50

THE WORKING OF METALS....Seventeen papers by leading authorities in the metal world presented at the two-day Cleveland Symposium on Plastic Working.
469 Pages, red cloth, 6 x 9 .....$3.00

PHYSICAL TESTING OF METALS ....by H. D. Churchill
Fundamental principles, application, interpretation of various tests. Contains 110 pages....illustrated by 25 charts and photographs, 6 x 9 .....$2.00

GRAIN SIZE SYMPOSIUM....Papers presented by 16 authorities at the National Metal Congress on grain size studies and the control of grain size in ferrous metals.
335 Pages, 6 x 9—Cloth Binding.....$2.50

CONSTITUTION OF STEEL AND CAST IRON....by F. T. Sisco
Explaining in a clear understandable manner the metallurgical functions of carbon and the common alloying elements.
332 Pages, 6 x 9—Cloth Binding.....$3.00

INCLUSIONS IN IRON....by C. E. Wohrman
A careful study of the common inclusions, their nature and effect.
162 Pages, 6 x 9—Cloth Binding $3.00

NITRIDING SYMPOSIUM....Papers presented by several authorities at one of the recent Conventions of the Society.
222 Pages, 6 x 9—Cloth Binding.....$1.50

THE QUENCHING OF STEELS....by H. J. French
Throws further light upon the laws of cooling, especially under conditions simulating those encountered in the practical heat treatment of steels.
177 Pages, 6 x 9—Cloth Binding $2.00

HEAT TREATMENT, USES AND PROPERTIES OF STEEL....by H. B. Knowlton
Covers the various plain carbon and alloy steels, their selection and properties obtainable by various treatments.
437 Pages, 6 x 9—Cloth Binding.....$4.00

METALLOGRAPHIC TECHNIQUE FOR STEEL....by J. R. Vilella
This book was written with the aim of showing exactly how structures of steel are affected by the various operations involved in the metallographic process.
85 Pages, 90 illustrations, 6 x 9—Red Cloth Binding $2.00

MACHINING OF METALS....Five lectures on machinability delivered at the Detroit Metal Congress.
177 Pages, 6 x 9, 132 illustrations—Red Cloth Binding $2.00

American Society for Metals
7016 Euclid Avenue, Cleveland, Ohio
Gentlemen:

Please send me the books circled above, for which I am enclosing.....in cash ( ), money order ( ), check ( ), purchase order ( ).

NAME .....

ADDRESS .....

CITY .....STATE .....